National Data Warehouse Project

National Patient Reporting Information System

Office of Information Technology (OIT)
and the
Indian Health Performance Evaluation System (IHPES)

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National Data Warehouse
An Overview

- Purpose
- Design
- NDW1 Project Scope
- User Benefits
- Data Integrity
- Timeline
- Accessing Data in the NDW
- The Future

NDW Purpose

- Improve our ability to provide a broad range of retrospective clinical and administrative information to managers at all levels of the Indian health system to allow them to better manage individual patients, local facilities, regional and national programs and to allow IHS management to provide legislatively required reports to the Administration and Congress.

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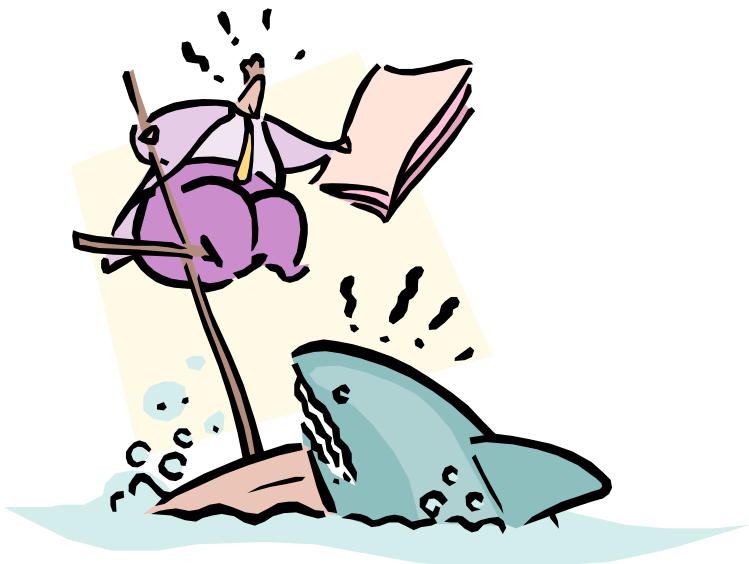
The Dilemma…

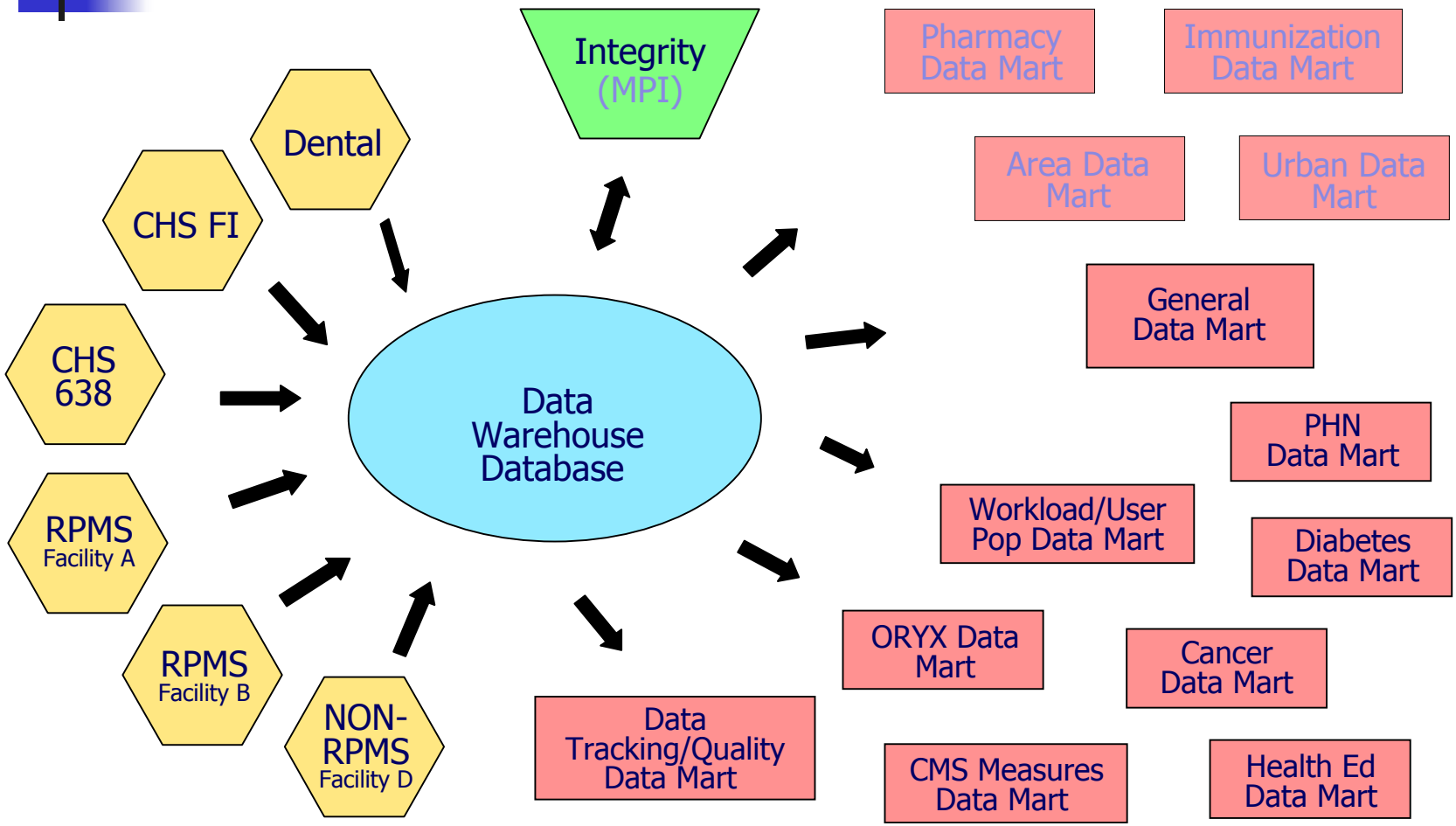


- We need a complete, all-inclusive solution and we needed it yesterday
- But to plan, build, and implement a complete solution would take far, far too long and would not deliver incremental value to our users along the way

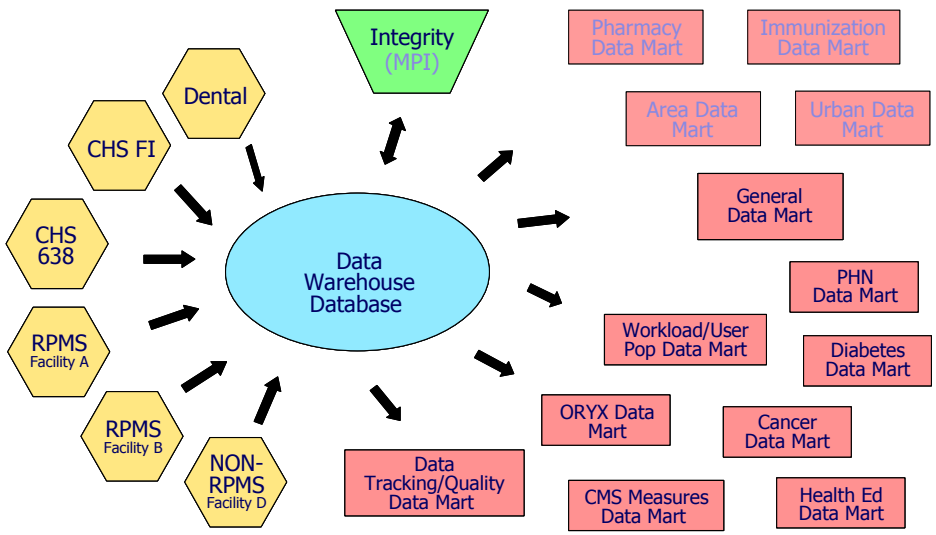
The Solution

- Build the data warehouse environment in increments that deliver value to users at each step
- The most critical user needs will be addressed first

High-Level NDW1 Architecture

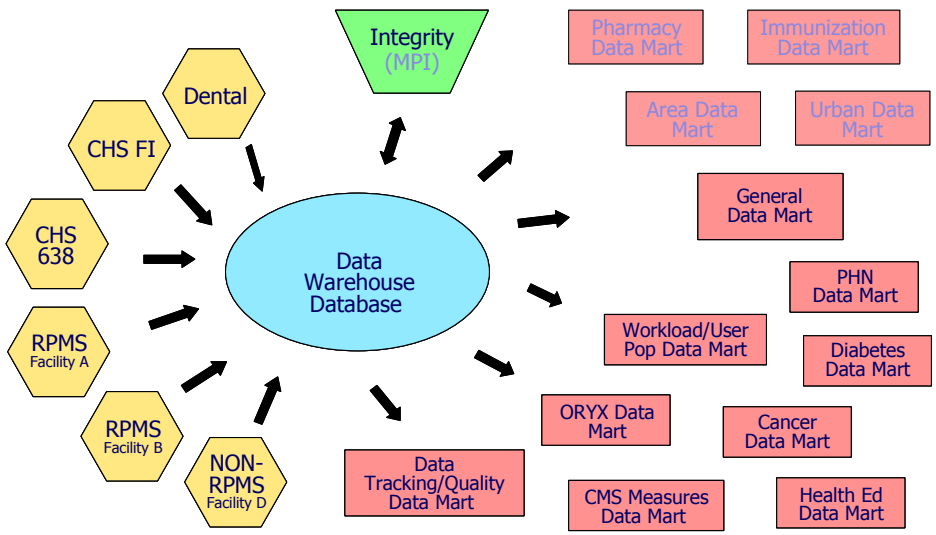


The NDW1 Environment Will..



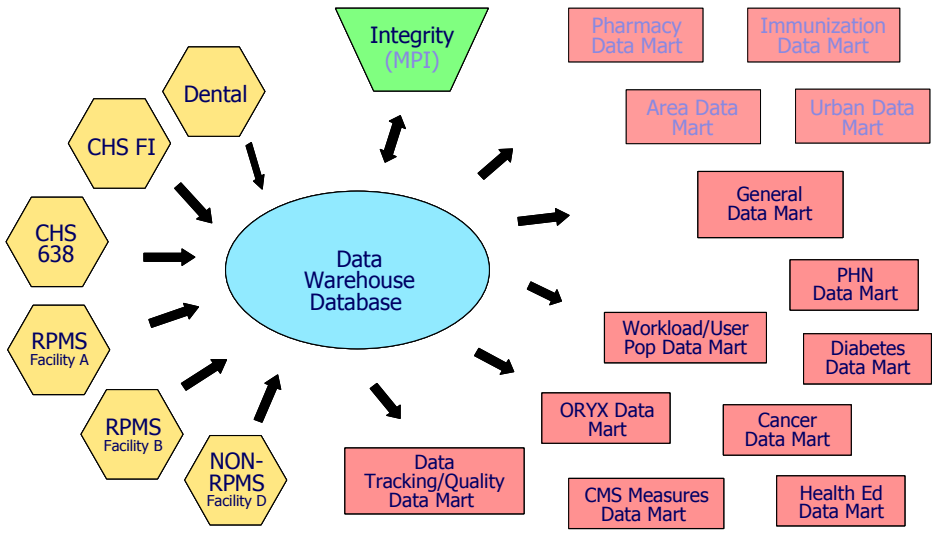
- Accept registration and encounter-based patient data…
- …from sites using RPMS or other IT systems…
- …and CHS data from the Fiscal Intermediary and Area databases.

The NDW1 Environment Will..



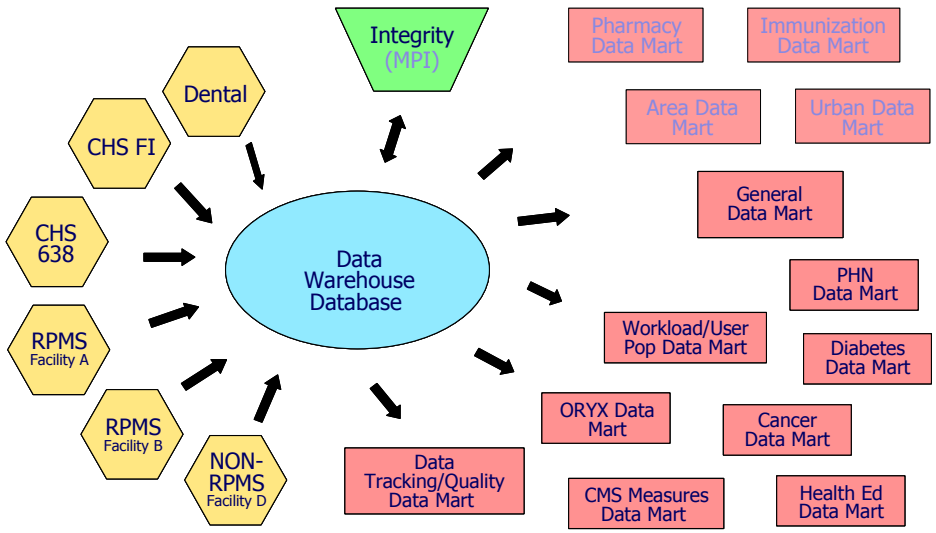
- Employ healthcare industry standards (HL7) for data transport and messaging …
- …and an Integration engine to route those data from sites to the proper destinations (e.g., the DW, an Area database).

The NDW1 Environment Will..



- Collect and store information almost exactly as it is received from the field …
- …maintaining historical snapshots of those data…
- …maintaining as much of its informational content, as possible.

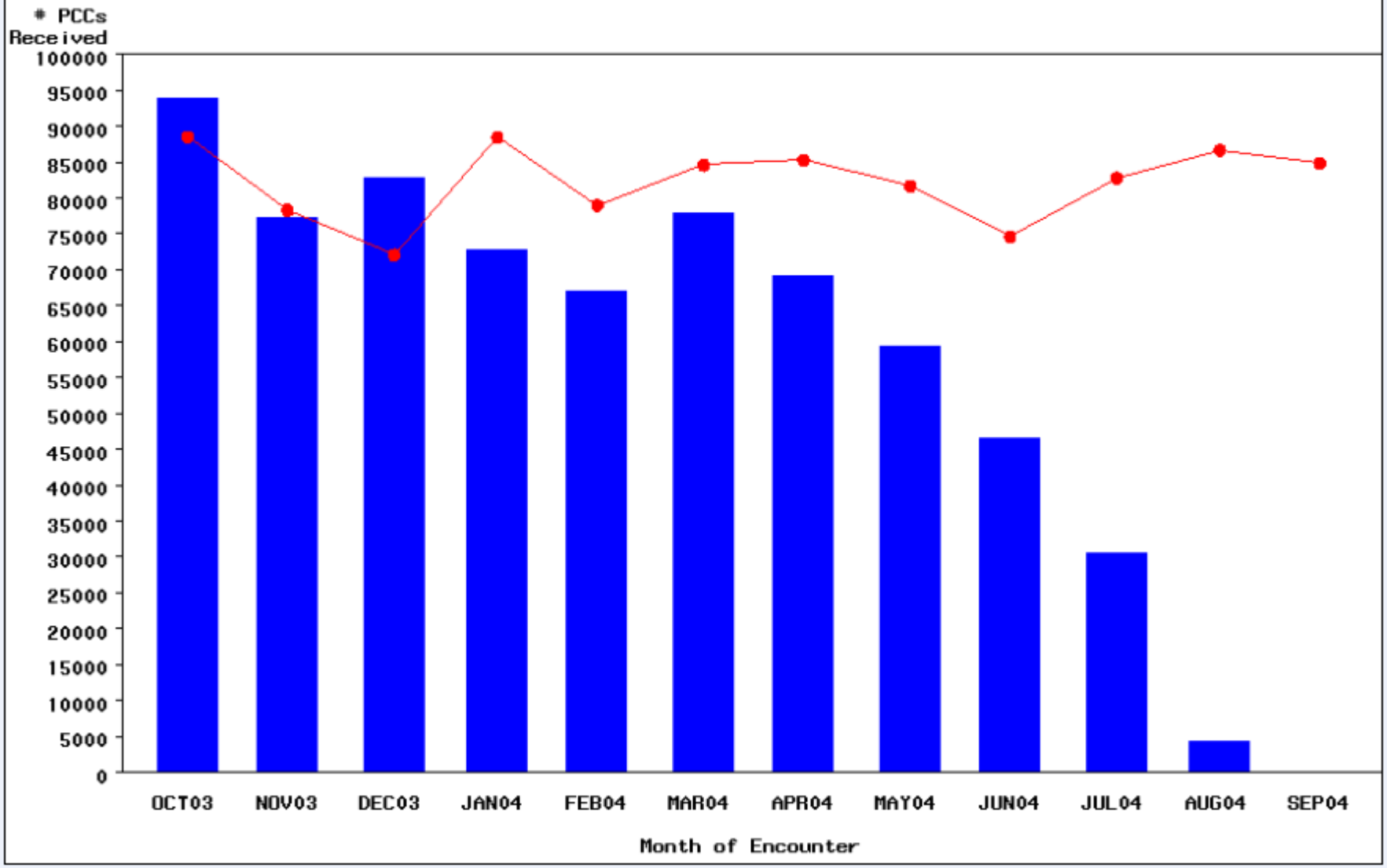
The NDW1 Environment Will..



- Provide accurate and helpful information about the data it receives to our field colleagues:
  - Record counts
  - Timeliness of data
  - Less than expected counts based on historical benchmarks
  - Missing data in fields, erroneous codes

RPMS PCC Three Year Average and Expected Volume Report

Sample Area RPMS PCC Outpatient Data Exported to National Programs
Graph Represents FY 04 Data Compared to Three Year Historical Average
Report Date: Friday, 20AUG2004



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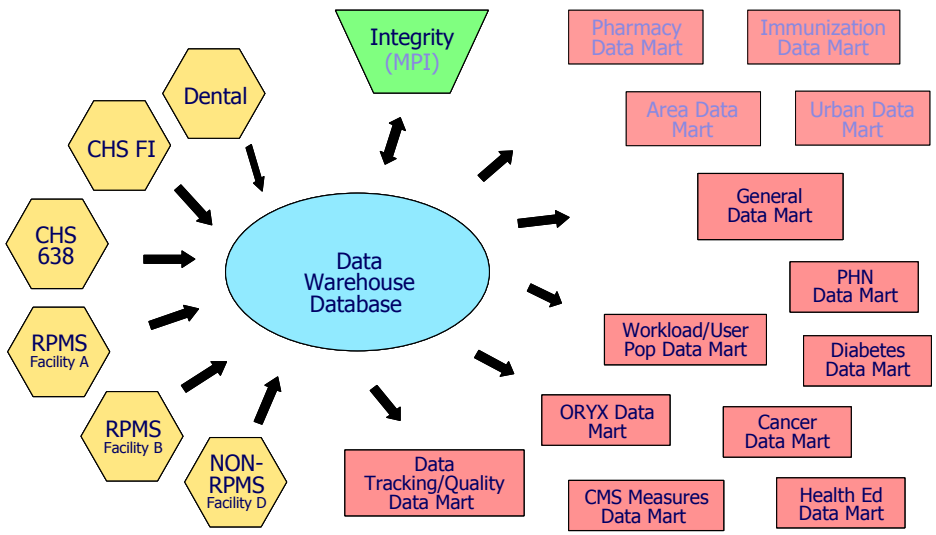

- Supply data to various data marts from which more targeted information can be gathered
  - Workload/User Pop
  - Data Tracking/Quality
  - Outcome measurement (ORYX, CMS measures, GPRA)
  - Organizational units (Area, Urban)
  - Programs (diabetes, cancer, health education, public health nursing, epidemiology, dental, pharmacy)


IHPES/ORYX Portal: applicationTemplateLeftMenu.jsp - Microsoft Internet Explorer
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Indian Health Service
The Federal Health Program for American Indians and Alaska Natives
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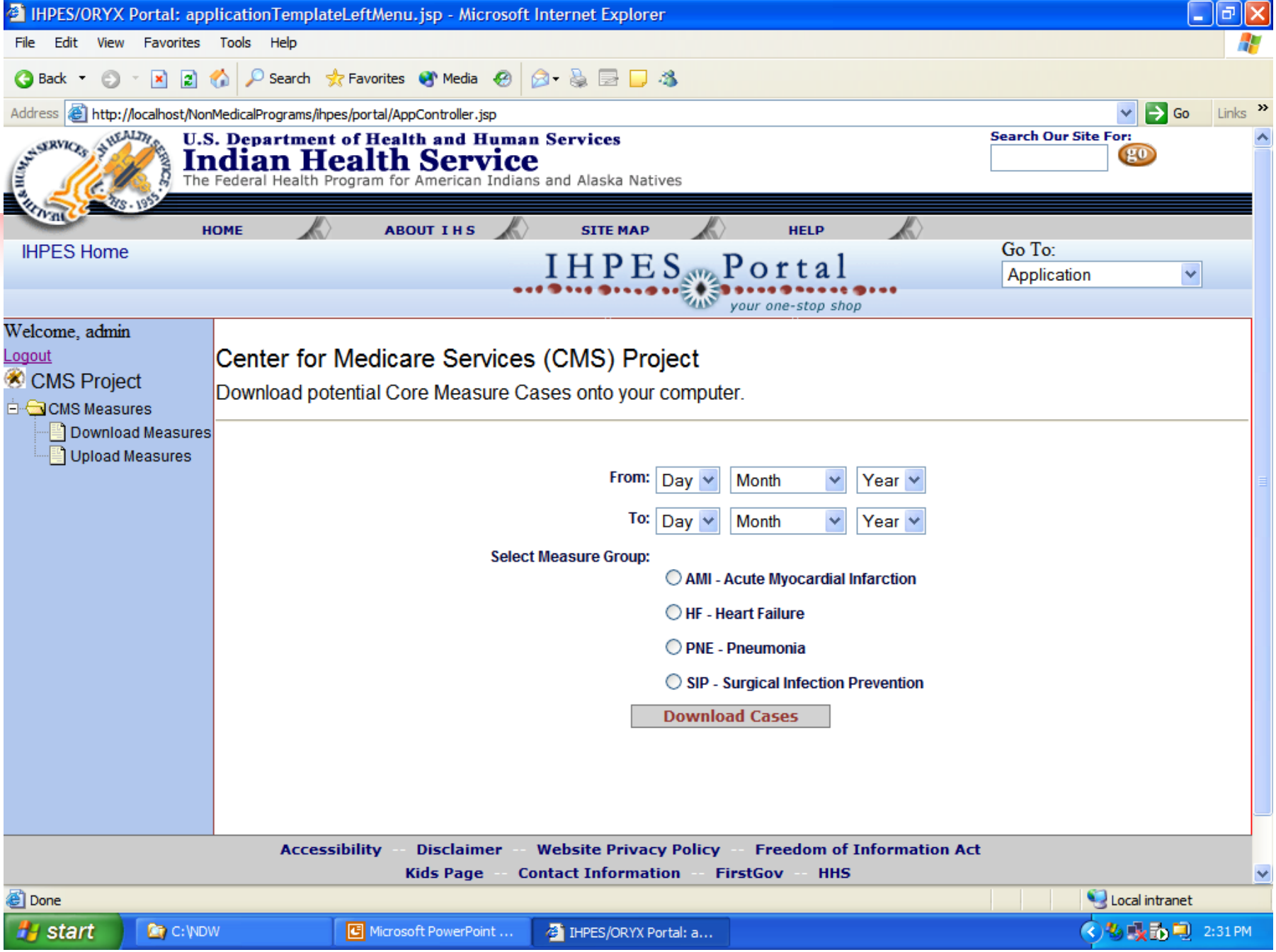
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Logout
CMS Project
CMS Measures
Download Measures
Upload Measures
Center for Medicare Services (CMS) Project
Download potential Core Measure Cases onto your computer.
From: Day Month Year
To: Day Month Year
Select Measure Group:
AMI - Acute Myocardial Infarction
HF - Heart Failure
PNE - Pneumonia
SIP - Surgical Infection Prevention
Download Cases
Accessibility -- Disclaimer -- Website Privacy Policy -- Freedom of Information Act
Kids Page -- Contact Information -- FirstGov -- HHS
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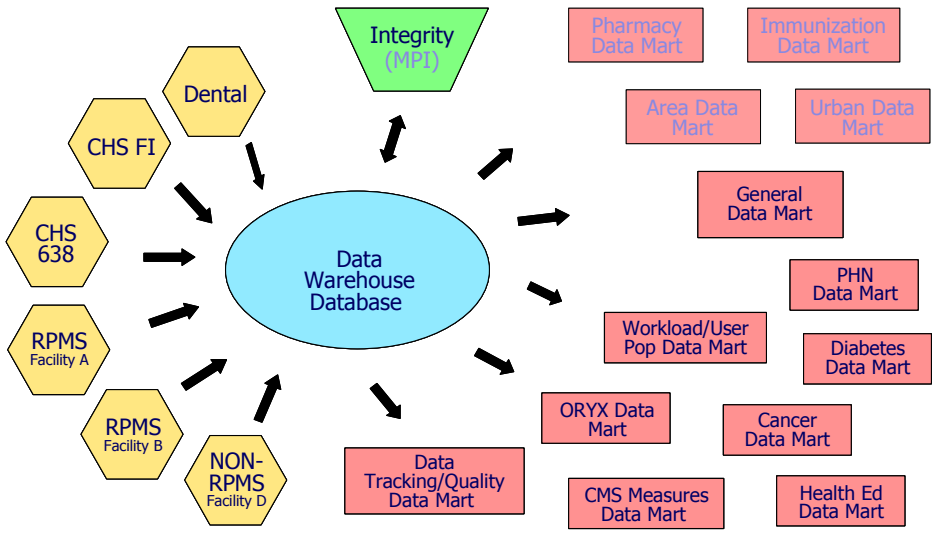
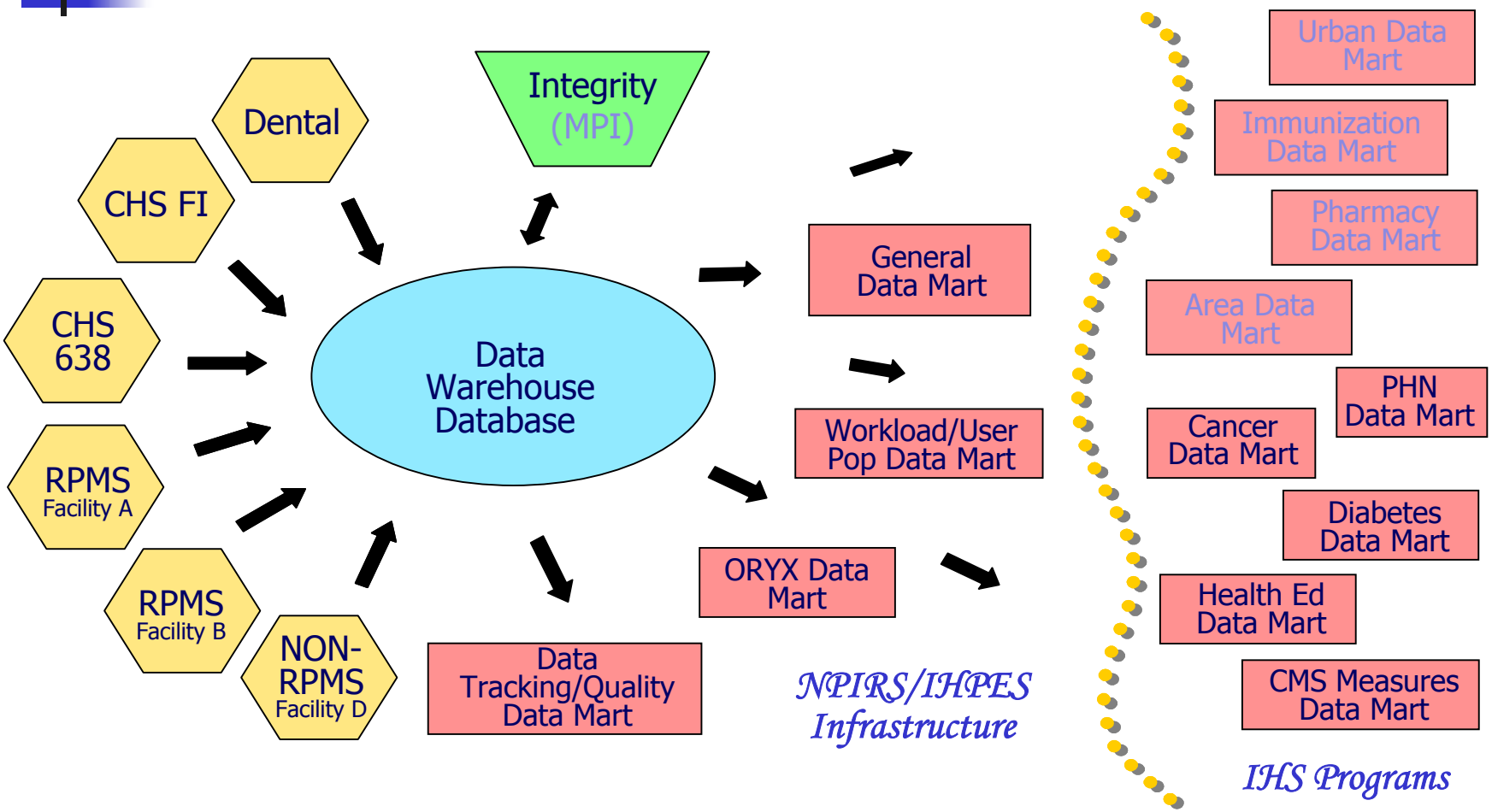


- Use a "probabilistic matching application to resolve by individual across facilities…
- …and use a more complete "Master Person Index" application, when available.

NDW Organizational Architecture



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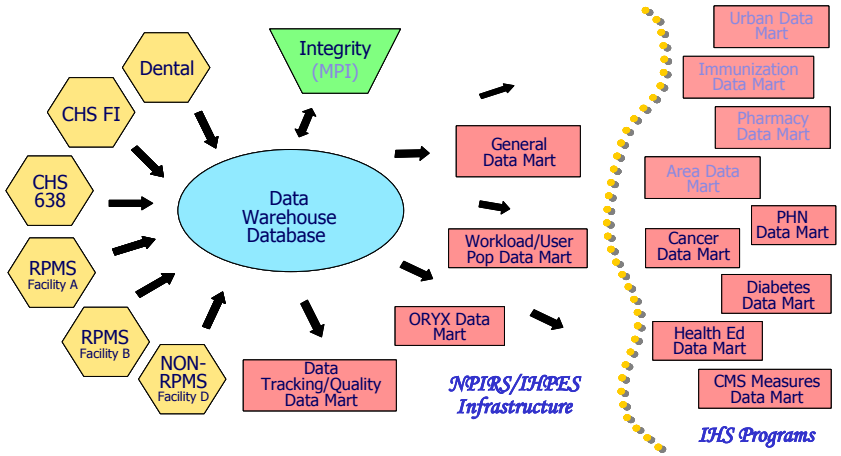

- Underlying DW database, technical infrastructure, general user data marts
  - Primary responsibility – ITSC/IHPES
  - ETL, staging and target tables, administrative and lookup tables
  - "Super users" have access to general data mart that contains a wide spectrum of current data
  - ORYX, CMS Measures, and User Pop/WL data marts
  - Provides data to populate the the more targeted data marts
  - Users of this component are the "super-users" of the general data marts and the more targeted data marts

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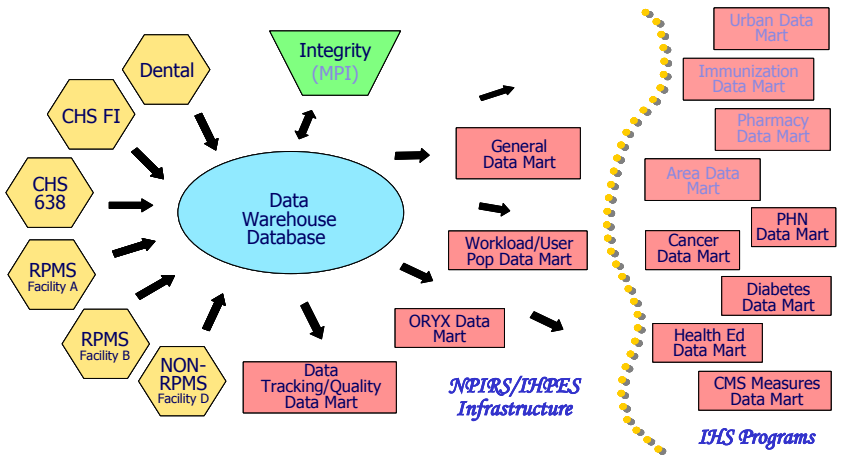

- "Component-ized" targeted data marts
  - Primary responsibility – programs, disciplines, organizational units
  - ITSC "hosts" the infrastructure, provides the security protocols, etc.
  - Very specific, limited subsets of data
  - Emphasis on search efficiency
  - Main focus are pre-structured reports
  - Users of this component are the programs, disciplines, organizational units

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NDW1 Project Scope

- What is in

  and

- What is out

In Scope

- Accept all the encounter- and registration-record-based data elements (with a few additions) included in the most recent RPMS export to NPIRS and IHPES
- Create a highly normalized information model that accommodates all of these elements (so that it will be able to accept all entries in a multiple field such as diagnoses, immunizations, ADA codes, etc. rather than just an arbitrary, limited number such as “the first 3”)
- Implement the unique IDs for both registration and encounter records so that they can be accurately linked.

In Scope

- Implement a unified registration and encounter record export so that we minimize the chance the DW will receive an encounter record without a registration record with which to link it
- Maintain historical snapshots of the state of registration and encounter records so that we can reproduce reports based on data in existence at some set point in the past

In Scope

- Utilize the stated IHS Architecture for the RPMS export (and wherever possible, the non-RPMS exports) to the DW including:
  - Utilize the industry standard HL7 format
  - Utilize an Interface Engine to route and reformat these exports
  - Implement appropriate security and privacy controls as required by HIPAA and Privacy Act regulations
- Enhance export tracking information to local exporting facilities and Areas
- Provide better tools to assure data integrity and report errors

In Scope

- Produce all current and essential Agency reports including
  - Workload and User Population reports
  - JCAHO ORYX reports
- Provide easy to use, readily available, search efficient access for authorized users to appropriately configured clinical and administrative data, including standard reports and ad hoc access, using both web-based technologies and end-user desktop applications, appropriate user-specific access controls, etc.

In Scope

- Pilot tools for assessing site-specific data quality, e.g., assessing field content, variations in historical norms in the numbers of records received
- Design the system so that it can best accommodate future, as of yet unanticipated needs

Out of Scope
(for NDW1)

- Data elements not on the list provided on the Data Warehouse web page at http://www.ndw.ihs.gov/.
- Certain registration-record-based clinical information such as:
  - problem list diagnoses or conditions
  - history of surgery or procedures
  - allergies or adverse reactions
  - last occurrence of various measurements, immunizations, exams, etc.
- A definitive method to unduplicate records of the same encounter that are received from multiple source systems (e.g., PCC versus the IHS Fiscal Intermediary)
- Employee information
- Equipment information

Out of Scope
(for NDW1)

- Billing information (costs, fees, billed amounts, paid amounts, etc.) - other than certain specified third party eligibility information
- Cost accounting (specific costs for provided services) - other than estimates that can be derived from information already collected in DW1
- Data from outside sources such as Vital Statistics, Census, Medicare and Medicaid (although pilot efforts are planned in DW1 to begin to look at some of these)
- A national level operational data store (ODS).
- A fully featured national level master person index (MPI).

This is a Data Warehouse, not an Operational Data Store

- A data warehouse:
  - Maintains periodic historical snapshots
  - Nonvolatile
  - Time-lagged, periodic exports
  - More focused on retrospective analyses
- An operational data store:
  - Maintains current state
  - Volatile
  - Real time exports
  - More focused on ongoing, up-to-the-minute individual care, billing, etc.

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Benefits for our Users

- Improved report accuracy because of improved linking between registration and encounter records
- More confidence in data - better able to verify reports with local data
- Improved data tracking and data quality assessment tools
- Better able to report patient “outcomes”
- Better support for Areas’ performance measurements, health status assessments, and surveillance

Benefits for our Users (cont.)

- Better consistency among reports - a rigorously gathered, verified, and maintained "single version of truth"
- Lessened local burdens in producing GPRA measures
- More choices for ORYX users
- More information available for Tribal EPI Centers
- Better information to support Diabetes monies